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Lecanora weii, a new multispored species of *Lecanora* s. str. from northeastern China

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Abstract––A new multispored species of *Lecanora* containing usnic acid, *L. weii* is described as new to science. A key to the four known multispored species of *Lecanora* in China is also provided.

Key words––*Ascomycota*, flora of China, lichens, pruinose discs

Introduction

Lecanora is characterized by asci of the *Lecanora*-type, simple ascospores, and crustose thalli. The taxa of *Lecanora* grow on a wide variety of substrata, such as rocks, soil, bark or wood. The multispored taxa share the characteristics in anatomy and chemistry with the majority of species within *Lecanora* sensu stricto and belong to what is commonly referred to as the *Lecanora subfusca* group (Brodo 1984, Lumbsch 1994). They only differ in having more than eight spores per ascus, and appear to be polyphyletic in origin (Guderley & Lumbsch 1999).

The multispored species group of *Lecanora* includes six species worldwide: *L. bruneri* Imshaug & Brodo, *L. cateilea* (Ach.) A. Massal., *L. japonica* Müll. Arg., *L. pleospora* Müll. Arg., *L. praesistens* Nyl., and *L. sambuci* (Pers.) Nyl. The characters of these multispored species have been discussed in detail by Imshaug & Brodo (1966), Miyawaki (1988), and Purvis et al. (1992). Guderley & Lumbsch (1999) specifically studied the multispored species to clarify the relationship of the multispored species to members of *Lecanora* sensu stricto.

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In China, Wei (1991) enumerated 63 species, 11 varieties and 5 forms of *Lecanora*, although not including any multispored species. An additional 12 eight-spored species have been reported since 1991 (Cao et al. 1995, Abbas & Wu 1998, Aptroot & Seaward 1999, Mamut et al. 2004). Three multispored species of *Lecanora* (*L. bruneri*, *L. cateilea*, and *L. japonica*) were reported by Wang et al. (2007).

During the study of *Lecanora* from China, we discovered a species new to science. We provide here general data on habitat, diagnostic characters, geographic distribution of the new species and a key for the identification of the four known multispored species of *Lecanora* in China.

Materials and methods

The present paper is based on collections from the Herbarium Mycologicum Academiae Sinicae-Lichenes (HMAS-L). All the specimens were examined and measured under a dissecting microscope (Motic SMZ-140) and compound microscope (Olympus CH). The anatomy of the apothecia was observed in free-hand sections mounted in water. The crystals in the apothecia described are only those visible in polarized light (under Motic PM18). For a more detailed study of discs, a scanning electron microscope (Hitachi S-570) was used. Secondary metabolites were identified using thin-layer chromatography (TLC) (Culberson 1972).

Results and discussion

Key to the multispored species of *Lecanora* in China

1a. Apothecial discs epruinose; epihymenium egranulose, spores 7.5–12.5 × 4.0–7.0 µm ..... ***L. japonica***

1b. Apothecial disc pruinose, epihymenium granulose 2

2a. Apothecial sections P– (lacking psoromic acid, but containing usnic acid); ascospores 12.0–14.5 × 6.0–8.5 µm ..... ***L. weii***

2b. Apothecial sections P+ yellow (psoromic acid present, usnic acid absent); ascospores 6.5–12.0(–13.0) × (3.5–)5.0–7.5 µm 3

3a. Apothecia densely clustered; apothecial margins thick, persistent; ascospores 12–16 per ascus ..... ***L. bruneri***

3b. Apothecia abundant but scattered, apothecial margins usually thin; ascospores 8–12 per ascus ..... ***L. cateilea***

Taxonomic description

Lecanora weii L.F. Han & S.Y. Guo, **sp. nov.** Fig. 1a–c

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Thallus crustaceus, tenuis, cinereus, tartareus, continuus. Prothallus nigrofuscus. Soredia nulla. Apothecia sessilia vel ad basin constricta, 0.4–1.5 mm in diametro. Disci rubrofusci,

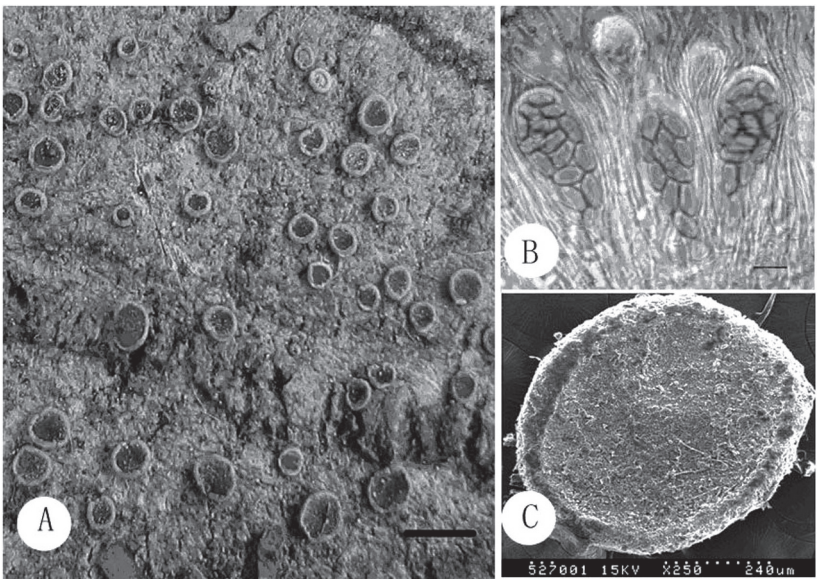

Fig. 1 Habit of *Lecanora weii*. **A.** Thallus with numerous apothecia. Scale = 2 mm. **B.** Section through apothecium (stained by 2%Toluidine blue about 30 min before adding 10% KOH), showing multispored asci and paraphyses. Scale = 15 μm. **C.** SEM photograph, showing pruina on the apothecial disc. Scale = 240 μm.

pruinosi. Margo thallinus albidus, integer. Cortex indistinctus, 2–5 μm. Amphithecium crystalla minuta continens. Epihymenium rubrofuscum, granulosum, ca. 10–20 μm altum. Hymenium hyalinum, 60–80 μm altum. Hypothecium et subhymenium hyalinum, 30–50 μm altum. Asci clavati, 12–16 spori. Ascosporae hyalinae, simplices, 12.0–14.5 × 6.0–8.5 μm. Pycnidia non visa. Thallus atranorinum, acidum usnicum et alium continens.

Etymology: This species is named in honor of Prof. Jiang-chun Wei (Beijing), the collector of the type specimen and a distinguished lichenologist, who as author of numerous papers and books on lichenology is regarded as "the father of lichenology in China". It also expresses our deepest gratitude for his encouragement and support in our *Lecanora* studies.

Holotype: CHINA. Heilongjiang. Mt. Dailing, Liangshuilinchang (Liangshui forest farm), alt. 350 m, on bark, 1975 V 8, Wei Jiang-Chun 2139 (HMAS-L 75828-1, holotype).

Thallus crustose, thin, continuous, coarse to slightly areolate, pale gray to gray, esorediate, epruinose, often with a black prothallus. Apothecia abundant, often single, sessile to constricted at the base, 0.4–1.5 mm in diam., disc red brown to dark brown, slightly to heavily pruinose, concave to plane, margins thin, prominent, smooth, entire, concolorous with thallus (Fig. 1A & 1C). Amphithecium: cortex thin 2–5 μm laterally, 5–10 μm basally; algal layer 40–65 μm laterally, 60–120 μm basally, containing numerous small KOH-

insoluble crystals. Epihymenium orange brown, with coarse crystals, which dissolve KOH and HNO_3, 10–20 μm tall. Hymenium hyaline, 60–80 μm tall, subhymenium colorless, 10–20 μm tall, hypothecium colorless, 20–25 μm tall, paraphyses not thickened or slightly thickened apically. Asci clavate, 12–16 spored. Ascospores ellipsoid to broadly ellipsoid, colorless, simple, 12.0–14.5 × 6.0–8.5 μm (Fig. 1b). Pycnidia not seen.

Chemistry—Thallus K+ yellow, KC+ yellow; containing atranorin, usnic acid and unknown substances.

Distribution and substrate—At present, *L. weii* is known only from the type locality, and nearby regions in northeastern China; on bark.

Additional specimens examined—CHINA. Heilongjiang, Mt. Dailing, alt. 350 m, 1975 X 5, J.C. Wei 2139 (HMAS-L 75828-1); alt. 400 m, 1975 X 6, J.C. Wei 2160-2 (HMAS-L 45663-2); Jilin, Mt. Changbai, alt. 840 m, 1984, X.D. Lu 848131-1 (HMAS-L 76108-1).

Comments—This species is readily distinguished by its heavily pruinose apothecial discs, numerous small KOH-soluble crystals in the amphithecium and the presence of usnic acid. *Lecanora weii* is similar to *L. cateilea* in having multispored asci and pruinose apothecial discs, but the latter is distinguished by containing psoromic acid and zeorin and lacking usnic acid (Guderley & Lumbsch 1999, Wang et al. 2007). *Lecanora sibirica* Müll. Arg. agrees with *L. weii* in containing usnic acid and also has heavily pruinose apothecial discs. The species, however, is readily distinguished by 8-spored asci and the presence of zeorin (Lumbsch et al. 1997). At present, *L. weii* is the only multispored species containing usnic acid.

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